Smithton Bridge
Spanning the Youghiogheny River on
State Road 981
Smithton
Westmoreland County
Pennsylvania

HAER No. PA-97

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
MID-ATLANTIC REGION, NATIONAL PARK SERVICE
DEPARTMENT OF THE INTERIOR
PHILADELPHIA, PENNSYLVANIA 19106

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Smithton Bridge

Location:	Spanning the Youghiogheny River and the Pittsburgh and Lake Erie Railroad on State Route 981 Smithton, Westmoreland County, Pennsylvania UTM: 17.606880.4445720 Quad: Smithton
Date of Construction:	1900. Minor alterations in 1935 and 1964
Builder/Designer:	Pittsburgh Bridge Company of Pittsburgh, Pennsylvania
Present Owner:	Commonwealth of Pennsylvania Department of Transportation Transportation & Safety Building Commonwealth and Forester Avenues Harrisburg, Pennsylvania 17120
Present Use:	Vehicular bridge
Significance:	The Smithton Bridge is the oldest remaining cantilever truss highway bridge in Pennsylvania. It is a typical example of the suspended span cantilever truss that was being built in the United States about 1885. The bridge is one of 144 Pennsylvania highway bridges nominated to the National Register of Historic Places.
Project Information:	This documentation was undertaken in February 1986 in accordance with the Memorandum of Agreement by the Pennsylvania Department of Transportation as a mitigation measure prior to the demolition of the bridge. Paula A. C. Spero Historic Structures Consultant for the Pennsylvania Department of Transportation Baltimore, Maryland
Edited and Transmitted by:	Jean P. Yearby, HAER, 1987

The Smithton Bridge, built in 1900, was the first bridge ever constructed to cross the Youghiogheny River at this location between South Huntingdon and Rostraver Townships. Prior to the erection of this bridge, the river was crossed by means of a ford located downstream from the present crossing. As illustrated in the Westmoreland County Road Docket of 1889 to 1899, the public road curved along the riverbank and crossed the river where it was shallow. The Smithton ford proved adequate for crossing the Youghiogheny River for over a century.

Smithton had grown slowly from the time of its establishment as Smith's Mills at the start of the nineteenth century. The population was mostly farmers, but during the nineteenth century, it numbered several grist mills, a paper mill, a feed mill, and a flour mill as its industrial base. At first, the goods produced in Smithton were shipped up and down the Youghiogheny River on flatboats which traveled at high water. In 1855, transportation became easier when the B&O Railroad's Pittsburgh to Connellsville line went through Smith's Mills; the B&O track was laid along the east bank of the river. Then, in 1883, the Pennsylvania and Lake Erie Railroad completed its line from McKeesport to Connellsville, laying its track on the west bank of the river. Taking advantage of this improving transportation network, additional small businesses were established at the turn of the century. These included small businesses like bakery and ice cream manufacturers, as well as the establishment of the still-viable Eureka Brewery and Pritts Flour and Feed Company.

Smith's Mills changed its name to Smithton in 1882, with the establishment of its first post office. In 1901, Smithton was incorporated as a borough. The years from 1895 to 1905 were considered boom years by the residents of Smithton. Houses and stores were built on every available lot within the boundaries of the small town. Three hotels were constructed and were kept busy. According to Smithton historians, during the decade from 1895 to 1905, more freight was unloaded at Smithton than at any other point between McKeesport and Connellsville. Products that were shipped to the towns along the river from Smithton included Surprise Flour, Eureka Beer, Pringle's pop and ice cream, and Raithel's bread.

The need for a more reliable river crossing at Smithton became evident during this boom time. In 1899, the residents from both sides of the river petitioned the Westmoreland County Court judges to approve a bridge "over the Youghiogheny River at the a place where...the State Road leading from the Village of Smithton to North Bellevernon crosses the said river...the ford there being frequently rendered impassable by reason of ice and high water..." After inspecting the site, the court approved the request, specifying that the petitioners pay $1,200.00 of the cost and that Westmoreland County pay the remainder. A contract was approved by the court on February 3, 1900.

The Smithton Bridge was fabricated during 1900 by the Pittsburgh Bridge Company of Pittsburgh. This western Pennsylvania bridge building company was established in 1868 and was bought in 1900 by the American Bridge Company. The superstructure was erected by Nelson and Buchanon, contractors located in Chambersburg; Nelson and Buchanon often acted as agents for Pittsburgh Bridge Company. The substructure, of handsome ashlar construction, was built of local materials by local craftsmen. On December 27, 1900, the bridge was completed. The cost of the bridge was $58,500.00. Many Smithton residents contributed to raise the $1,200.00 required of them by the court.

The Smithton Bridge spans 733 feet across the Youghiogheny River between South Huntingdon and Rostraver Townships. On the west side of the river, the bridge also spans two sets of tracks on the Pittsburgh and Lake Erie Railroad. Smithton Bridge consists of four Pratt truss spans, comprising a three span cantilever truss which is continuous over Piers 1 and 2, and on simple span. The cantilever truss (spans 1 through 3) rests on ashlar substructure units, including the west abutment, Pier 1, Pier 2 and Pier 3. The simply-supported Pratt truss (span four) completes the bridge from Pier 3 to the east abutment. The individual truss members of the single span and the cantilever spans are typical of truss bridges of that era and consist of steel eyebars and built-up members of channels, angles, plates and lacing. Other structural features include pin connections and floor beam stringer deck systems. All four trusses are relatively narrow in width, measuring 19-1/2 feet from center to center of north and south truss; this makes the roadway width along the length of the bridge 16-1/2 feet from curb to curb.

Span 4 of the Smithton Bridge, the small Pratt through truss, is 119 feet long, and its configuration is typical of hundreds of small Pratt truss highway bridges built throughout the United States in the late nineteenth and early twentieth centuries. It is the cantilever truss (spans 1 through 3) which distinguishes this bridge. The cantilever truss is a design of relatively recent development in the evolution of bridge history. It was introduced in the 1860s on a small-scale and experimental basis in both the United States and Europe. No cantilever spans of significant size were constructed in the United States until the last quarter of the nineteenth century. By the end of that century, successfully-erected cantilevers established the fact that the longest truss spans were possible with cantilever trusses. In the last decade of the nineteenth century and in the early twentieth century, the cantilever truss was frequently used in the United States for major river crossings.

The truss configurations of a cantilever truss may be much like that of a simple truss, often looking like the proprietary Pratt or Warren types. The structure, however, is very different. The trusses of the cantilever bridge are continuous over their substructure supports, while the simply-supported truss rests on a support at each end only. Simple stated, a cantilever is analogous to a bracket, where one arm projects without support from an anchored end. In a cantilever bridge, the unsupported arms either meet in the center of the span or they are connected by a simple "floating or suspended" truss.

The first large scale, typically configured, suspended span cantilever truss built in the United States appears to have been C. C. Schneider's Niagara bridge, built in 1883. The cantilever arms of this structure did not meet at the center of the span but, instead, supported a center span designed as a simple truss. This type of cantilever, the suspended span cantilever, appears to have been the predominant type of cantilever bridge built in the late nineteenth century. Many of those built later, in the twentieth century, were more heavily configured and of the other type, wherein the cantilever arms met at the center.

In form, the cantilever spans of the Smithton Bridge typify the suspended span cantilever trusses of the late nineteenth century. There are two anchor spans (spans 1 and 3) measuring 187 feet, and a main span (span 2) measuring 238 feet. The main span consists of two cantilever arms which project 68 feet toward the center from Piers 1 and 2; between the two anchor arms is the 102-feet-long suspended span. This relationship of cantilever arms, anchor arms and suspended span is well illustrated on Sheet 2 of the 1935 bridge drawings.

With respect to the length of Smithton Bridge, it is an unusually small span for a cantilever bridge. In 1911, David Steinman stated in his text Suspension Bridges and Cantilevers that there were comparatively few cantilevers built with main spans which measured less than 500 feet. The 500 feet limit was considered the domain of the ordinary, simple-span truss. Thus, the Smithton Bridge is an example of a very small span cantilever bridge; the reason for choosing this structure type is unknown. It is possible that the site conditions precluded the use of a long, simple span truss. It is possible that the cantilever design was chosen because of the relative ease of its erection, without the need for temporary falsework. This type of structure enables erectors to begin building outward from each pier toward the center of the span, with the structure supporting itself as erection proceeds.

The Smithton Bridge structure remains essentially unaltered from its 1900 configuration. Rehabilitation work was done in 1935 and 1964, but it was minor with respect to the overall structure. The 1935 rehabilitation included repairing, or replacing in kind, top laterals and bottom laterals; replacing lacing bars and cover plates where necessary; and replacing the old roadway surface with a new one. The bridge had a blacktop wearing surface on timber planking which was replaced with a timber system of cross-ties and timber plank decking with steel traffic treads (24" plates located at the position of each tire). In 1964, the bridge deck was replaced again. An open steel grid flooring was installed on most of the bridge; the deck on the first few panels of spans 1 and 4 was replaced with concrete-filled steel flooring. At that time, repairs were also made to some of the truss members. Today, the bridge superstructure is in very poor structural condition, exhibiting large areas of corrosion damage and some member damage. The bridge substructure elements, particularly the piers, remain in good condition.

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